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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,998	07/24/2003	Yi-Li Hsiao	67,200-930	3724

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TUNG & ASSOCIATES
Suite 120
838 W. Long Lake Road
Bloomfield Hills, MI 48302

EXAMINER

MACARTHUR, SYLVIA

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/626,998	Applicant(s) HSIAO ET AL.	
	Examiner Sylvia R. MacArthur	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 3/17/2006.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-20 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

 a) ☒ All b) ☐ Some * c) ☐ None of:

 1. ☒ Certified copies of the priority documents have been received.

 2. ☐ Certified copies of the priority documents have been received in Application No. _____.

 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____

4) ☐ Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☒ Other: COPY OF JP 917770A

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 19, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Koike Akira et al (JP 9-17770).

Akira et al teaches a plasma process method wherein two refrigeration paths (11 and 14) are provided within a substrate support 9 to offset the radiant heat from chamber walls, see the constitution, see also Figure 1.

Regarding claim 9: Compensation coolant chamber 3 contains a compensation coolant (cooling medium) in fluid communication with the substrate support 5.

Regarding claim 15: The channels and compensation loop are illustrated in the Figure representing example 1.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2,4, 6,8, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akira et al.

The teachings of Akira et al were discussed above.

Regarding claims 2,4, 6,8, 10, and 12 : Akira fails to teach that the set point temperature is about 60 degrees C. However, the set point temperature of the chuck is an optimizable parameter based on such factors as type of coolant used and desired final temperature of substrate. According to In re Woodruff, 16 USPQ2d 1934 it would have been obvious to one of ordinary skill in the art to have determined the optimum value of a case effective variable through routine experimentation in the absence of showing a criticality. In this case the case effect variable is the set point temperature of the chuck which is known to effect the processing temperature of the workpiece. The determination of this processing parameter set point of the chuck temperature is well within the ordinary skill of one in the art to determine in order to provide the optimal heat transfer between the coolant and the substrate.

Thus, it would have been obvious for one of ordinary skill in the art to choose a coolant with a set point temperature of about 60 degrees C.

5. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akira et al in view of Okudaira et al.

Regarding claim 3: The teachings of Akira et al were discussed above. Akira et al fails to teach the cooling temperaure as recited in claim 3.

Okudaira et al teaches a dry etching method. According to col. 6 line 33, Okudaira et al teaches the cooling temperature is in the range of 50 to 130 degrees C.

The motivation to provide a coolant at about 50 degrees as taught in the range Okudaira et al is that the temperature of the coolant is an optimizable processing parameter.

According to In re Woodruff, 16 USPQ2d 1934 it would have been obvious to one of ordinary skill in the art to have determined the optimum value of a case effective variable (coolant temperature) through routine experimentation in the absence of showing a criticality. In this case the case effect variable is the coolant temperature which is known to effect the processing temperature of the workpiece. The determination of this processing parameter is well within the ordinary skill of one in the art to determine in order to provide the optimal processing temperature of the substrate. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide a coolant of about 50 degrees as taught within the range of Okudaira et al.

Regarding claim 5: Akira et al fails to teach water as the compensation fluid.

Water is used to maintain the temperature of the specimen stage see col. 6 lines 31-39 of Okaidura et al. The motivation to provide water as the coolant of the method of Akira et al is that water is a low-cost, easily acquired substance and known for its advantageous chemical and physical properties for use as a compensation fluid in heat transfer. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to provide water as the coolant for the compensation fluid.

6. Claims 7, 11, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akira et al in view of Hideo et al (JP 2003-248322).

The teachings of Akira et al were discussed above.

Akira et al fails to teach the coolant temperature is about 50 degrees C.

Hideo et al teaches a method for producing an original printing plate (a semiconductor manufacturing process). A coolant is used to maintain the temperature of the substrate according to Section [0084]. The coolant temperature is 50 degrees C or less.

The motivation to provide the coolant at that temperature is that it is suggested by Hideo et al that 50 degrees C or less provides the optimal heat transfer for optimal temperature control of the wafer.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the method of Akira et al with the teachings of Hideo to provide the coolant at 50 degrees C as it provides optimal heat transfer.

Additionally, the temperature of the coolant is an optimizable processing parameter.

According to In re Woodruff, 16 USPQ2d 1934 it would have been obvious to one of ordinary skill in the art to have determined the optimum value of a case effective variable (coolant temperature) through routine experimentation in the absence of showing a criticality. In this case the case effect variable is the coolant temperature which is known to effect the processing temperature of the workpiece. The determination of this processing parameter s is well within the ordinary skill of one in the art to determine in order to provide the optimal processing temperature of the substrate.

Thus, it would have been obvious for one of ordinary skill in the art to choose a coolant with a temperature of about 50 degrees C and a set point temperature of 60 degrees C.

Art Unit: 1763

7. Claims 13,14, and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akira et al in view of Long et al (US 6,608,352).

The teachings of Akira et al were discussed above.

Akira et al fails to teach a p-n junction module.

Long et al teaches a chuck 208 coupled to a temperature controller 210 a p-n junction current meter 214 is coupled between the p-n junction formed by the first doped region 204 and the drain region 156, see col. 6 lines 9-48.

The motivation to provide a p-n junction module is that it provides a mechanism for determining the thermal resistance of a substrate in an easy yet accurate manner.

Regarding claim 17: A main temperature characteristic curve is seen in Fig. 5.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the method of Akira et al to provide a pn junction module to determine the thermal resistance of the substrate and thus enhance process control.

Conclusion

Response to Arguments

8. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection. The prior art of Akira et al illustrate tow circulating coolant paths in the figure illustrating example 1.


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-F during the hours of 8:30 a.m. and 5 p.m.

Application/Control Number: 10/626,998
Art Unit: 1763

Page 7

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Sylvia R MacArthur
Patent Examiner
Art Unit 1763

June 5, 2006